

as at this station. Lying due west is an extensive ravine about 30 miles long, reaching from the foothills to the summit of the main range of the Continental Divide. Within the confines of this great canyon are three lakes, varying in length from 1 to 3 miles in extent, the upper lake being about 1,000 feet above the lower. When a chinook is blowing, a billowy mass of vapor hangs over the upper lake like a great mass of cotton, white, unchanged in form, unvarying in shade, for hours at a time. It is a very beautiful spectacle and is known as the "white flag of the chinook."

NEVADA.

Mr. Charles G. Fogg, of Silver Peak, Nev., reports "On the 29th, Pogonip all over the valley."

In general, the Section Director, Mr. R. F. Young, notes that an area of high pressure, clear, cold, dry air, with light winds from the north, prevailed throughout the month, with more frost than usual. These are the conditions that favor the Pogonip, which is a mist of ice crystals or frozen fog and very injurious to the health of men and animals. Some remarks on the Pogonip will be found in the MONTHLY WEATHER REVIEW for February, 1894, Vol. XXII, page 77. We should be glad to publish a special study of the Pogonip in any one of the valleys of Nevada.

ARKANSAS.

The detailed report of the Fort Smith tornado and that of the Crawford County tornado will be found in the January report of the Arkansas Section.

NEW ENGLAND.

A detailed account of the snowstorm and resulting damage in New England on the 25-26th and on the 31st will be found in the report of the New England Section. The blizzard of January 31-February 1 was comparable with that of March, 1888, and December, 1872, and January, 1867.

MARYLAND.

The report of the Maryland and Delaware Section gives an account of the establishment of twenty special stations by the Maryland State Weather Service, which is now enabled to take up profitable lines of research bearing upon the physiography, climatology, hydrography, forestry, and crops of that State. The work will be done in cooperation with the United States Geological Survey and the various bureaus and divisions of the United States Department of Agriculture. The problems to be first taken in hand will be "The influence of Chesapeake Bay and of the mountains of Washington County upon the crops in their respective vicinities. Four series of three special stations each will be established, reaching from the water's edge of Chesapeake Bay inland, and the twelve stations will represent the soils devoted to garden truck, wheat, corn, and fruit. Eight or more stations will also be established in Washington County at different elevations upon the mountain slopes, representing the upper and lower limits of successful cultivation of peaches. Observations of the temperature and moisture of the soil will be made in addition to the meteorological observations."

One can but hope that important economical results will flow from this notable effort on the part of Professor Clark and the State legislature to thus extend the work of the State service from the mere field of observation over into the field of agricultural investigation. Studies of a general character in this matter of the relations between climate and crops have been taken up by isolated agricultural experiment stations, and pretty much all that was known on the subject ten years ago was collected by the Editor in his report of June 30, 1891. The present investigation by Professor Clark is undoubtedly the most extensive that has yet been undertaken by any State or Government.

TENNESSEE.

In the report of the Tennessee section Mr. H. C. Bate, section director, states that he has on hand a number of the

earlier copies of these reports and other publications which will enable him to supply missing numbers to those who desire to complete their sets. We are sure that many students of climatology, in foreign countries as well as in the United States, will gladly avail themselves of this offer.

SPECIAL SNOWFALL BULLETINS.

A year ago Mr. Brandenburg, director of the Colorado State section of the Climate and Crop Service, initiated a system of special reports on the snowfall, which was found very useful in forecasting the quantity of water that became available for irrigation when the snow melted. We take pleasure in noting the fact that Mr. Blythe, in charge of the Arizona section, has published a similar special snow bulletin for that State. At the close of January there was more snow than usual still remaining on the ground at many stations, while others reported that, although the snow had disappeared, yet the ground was thoroughly soaked, and the cold weather had caused the retention of an unusual quantity of water in the soil, so that, on the whole, there was a good prospect of an abundance of water for agricultural purposes.

THE ALMANACS AND THE WEATHER BUREAU.

During the past few months the Editor has noticed a number of newspaper paragraphs discussing the relative merits of the weather predictions published daily by the officials of the Weather Bureau for one or two days in advance, and those published by the numerous "farmers' almanacs," published several months, or even a year, in advance, and sold in large numbers throughout the country. The predictions of the weather, as made by the Weather Bureau, are based entirely upon the daily maps that show the actual condition of the atmosphere, as reported by reliable observers throughout the country. On the other hand, the predictions in the various almanacs are founded upon a variety of principles among which are the following:

1. The most conservative and rational almanacs are those that compile from the records of many past years a table showing what sort of weather has prevailed most frequently on the respective days of the year.

2. The least rational almanacs are those that pretend that the weather is controlled by planetary combinations and stellar influences, therefore, such predictions are properly said to be based upon astrology.

3. An intermediate class publishes predictions based upon the probability of spots on the sun, thereby assuming it to have been demonstrated that the solar spots control terrestrial weather.

4. The least scientific system of preparing the almanac predictions was explained to the Editor many years ago by a gentleman whose almanac made the greatest pretensions to high scientific accuracy. This gentleman stated that on certain days he felt endowed with a certain ability or inspiration. These were his weather making days, on which he sat down, and with the most absolute confidence in the accuracy of his work, wrote up the weather for the coming year, continuing at the work for a considerable time until the inspiration seemed to leave him, whereupon he necessarily stopped and delayed resuming the work until again filled with the spirit of divination.

Doubtless some almanac makers adopt a combination of the four preceding methods but, in general, these seem to be the principles most widely recognized in the long-range predictions of the almanacs, except only that in all cases the authors make free use of a system of general and rather indefinite terms that will apply just as well to a thunderstorm, a hurricane, or an earthquake. The warning "look out for something very unusual about this time" is, of course, not

meteorological prediction, and not nearly as definite as the railroad signboard "look out for the engine when the bell rings."

It must be acknowledged that the Weather Bureau has done wisely in abstaining from any attempt to make long-range predictions, based upon any or all of the four methods above mentioned. The method that is actually used in its daily work has nothing of the absurd profundity of the astrological method, but is based upon the simplest common sense. The hope of the Bureau, as expressed by General Myer in 1871, still continues to be our earnest aim, namely, to so educate every citizen that he may take an intelligent view of the daily weather maps and learn to make his own local predictions.

In connection with meteorology in general, and especially weather predictions, there is a popular tendency to make a mistaken use of the word "science." Knowledge is science as distinguished from the world of imagination, which is fiction. Whatever is logical and true may be called scientific, but whatever is illogical or untrue is certainly not scientific. A map or a survey that gives us an exact picture of the true location of every spot on the earth's surface responds to scientific geography. A catalogue of all the plants and animals on the earth or of the stars in the sky constitutes a biological or an astronomical survey, and is truly scientific. A series of maps of the weather at 8 a. m. daily is a scientific meteorological work, and any predictions of the weather that can be logically deduced from these maps is a scientific prediction. But a lot of predictions that are said to be deduced in defiance of sound logic and with a very imperfect knowledge of the laws of nature are fanciful fictions and not scientific, because they are contrary to all sound knowledge. Science can not possibly go contrary to the truth. Most scientific knowledge is so simple that it is taught in the schools to the children. There is not a child of the ten millions who attend

our public schools who has not been taught that the stars and planets have no influence on human affairs. On the other hand, there are some fields of study that are so difficult that only a few have time and taste to devote to them. These may, if one pleases, be called the most profound depths of science, but they are perfectly accessible to every logical student, and a century hence this profound science will have become clear to all and will be taught in our schools just as we now teach that which was unknown in the time of Galileo and which is even yet untaught in the schools of Turkey and China.

In the preceding lines we have had in mind the average or normal American citizen, one who believes that two and two are four and that a straight line is the shortest distance between two points, and all the other axioms and principles of natural science. On the other hand, we must recognize the fact that there is quite an appreciable percentage of human beings who do not accept these principles. These are those who can demonstrate that the world is flat; that the earth does not revolve daily or annually; who believe in squaring the circle, in perpetual motion, the Keely motor, and other incongruities. The philosopher De Morgan has well styled this class of humanity as "paradoxers." They can assent to the truth of principles and facts that the rest of the world can never indorse; they belong to a different part of the universe from that world in which we live, to a place where white is black, where *yes* means *no*, where a part is greater than the whole, where time runs backward, where the material controls the spiritual. It is conceivable that the Creator may have created many distinct systems of worlds and that the laws which obtain in our part of the universe do not hold good everywhere. The science that we are studying is simply the knowledge of the principles and the facts that belong to our part of the universe, where the "paradoxers" are entirely out of place.

METEOROLOGICAL TABLES AND CHARTS.

By A. J. HENRY, Chief of Division of Records and Meteorological Data.

Table I gives, for about 130 Weather Bureau stations making two observations daily and for about 20 others making only one observation, the data ordinarily needed for climatological studies, viz, the monthly mean pressure, the monthly means and extremes of temperature, the average conditions as to moisture, cloudiness, movement of the wind, and the departures from normals in the case of pressure, temperature, and precipitation, the total depth of snowfall, and the mean wet-bulb temperatures. The altitudes of the instruments above ground are also given.

Table II gives, for about 2,700 stations occupied by voluntary observers, the highest maximum and the lowest minimum temperatures, the mean temperature deduced from the average of all the daily maxima and minima, or other readings, as indicated by the numeral following the name of the station; the total monthly precipitation, and the total depth in inches of any snow that may have fallen. When the spaces in the snow column are left blank it indicates that no snow has fallen, but when it is possible that there may have been snow of which no record has been made, that fact is indicated by leaders, thus (. . .).

Table III gives, for about 30 stations furnished by the Canadian Meteorological Service, Prof. R. F. Stupart, director, the means of pressure and temperature, total precipitation and depth of snowfall, and the respective departures from normal values, except in the case of snowfall.

Table IV gives, for 26 stations selected out of 113 that main-

tain continuous records, the mean hourly temperatures deduced from thermographs of the pattern described and figured in the Report of the Chief of the Weather Bureau, 1891-92, p. 29.

Table V gives, for 26 stations selected out of 104 that maintain continuous records, the mean hourly pressures as automatically registered by Richard barographs, except for Washington, D. C., where Foreman's barograph is in use. Both instruments are described in the Report of the Chief of the Weather Bureau, 1891-92, pp. 26 and 30.

Table VI gives, for about 130 stations, the arithmetical means of the hourly movements of the wind ending with the respective hours, as registered automatically by the Robinson anemometer, in conjunction with an electrical recording mechanism, described and illustrated in the Report of the Chief of the Weather Bureau, 1891-92, p. 19.

Table VII gives, for all stations that make observations at 8 a. m. and 8 p. m., the four component directions and the resultant directions based on these two observations only and without considering the velocity of the wind. The total movement for the whole month, as read from the dial of the Robinson anemometer, is given for each station in Table I. By adding the four components for the stations comprised in any geographical division the average resultant direction for that division can be obtained.

Table VIII gives the total number of stations in each State from which meteorological reports of any kind have been re-